

SEQUENCE LISTING

<110> KYOWA HAKKO KOGYO CO., LTD.

<120> F₀F₁-ATPase polypeptides and their genes

<130> 11329US1

<150> JP 2000-234317

<151> 2000-08-02

<160> 21

<170> PatentIn version 2.1

<210> 1

<211> 304

<212> PRT

<213> Corynebacterium ammoniagenes

<400> 1

Met Cys Asp Gly Val Arg Ser Cys Asp Arg Glu Phe Glu Thr Ser Ile

1

5

10

15

Ala Pro Tyr Asp Val Asp Asn Arg Thr Ala Arg Thr Arg Glu Arg Thr

20

25

30

Leu Ser Val Thr Thr Leu Ala Met Lys Gly Ser Phe His Ala Pro Glu

35

40

45

Leu Asp Pro Glu Phe Phe Pro Gly Gln Tyr Tyr Gly Asp Ile Leu Phe

50

55

60

Asp Asp Val Leu Gly Gly Trp Phe Ala Leu Asp Arg Ile Met Leu Val

65

70

75

80

Arg Leu Leu Met Thr Ala Val Leu Val Leu Leu Phe Ile Ala Ala Phe	85	90	95
Arg Asn Pro Lys Leu Val Pro Lys Gly Leu Gln Asn Val Ala Glu Tyr	100	105	110
Ala Leu Asp Phe Val Arg Ile His Ile Ala Glu Asp Ile Leu Gly Lys	115	120	125
Lys Glu Gly Arg Arg Phe Leu Pro Leu Leu Ala Ala Ile Phe Phe Gly	130	135	140
Thr Leu Phe Trp Asn Val Ser Thr Ile Ile Pro Ala Leu Asn Ile Ser	145	150	155
Ala Asn Ala Arg Ile Gly Met Pro Ile Val Leu Ala Gly Ala Ala Tyr	165	170	175
Ile Ala Met Ile Tyr Ala Gly Thr Lys Arg Tyr Gly Phe Gly Lys Tyr	180	185	190
Val Lys Ser Ser Leu Val Ile Pro Asn Leu Pro Pro Ala Leu His Leu	195	200	205
Leu Val Val Pro Ile Glu Phe Phe Ser Thr Phe Ile Leu Arg Pro Val	210	215	220
Thr Leu Ala Ile Arg Leu Met Ala Asn Phe Leu Ala Gly His Ile Ile	225	230	235
Leu Val Leu Leu Tyr Ser Ala Thr Asn Phe Phe Phe Trp Gln Leu Asn	245	250	255
Gly Trp Thr Ala Met Ser Gly Val Thr Leu Leu Ala Ala Val Leu Phe	260	265	270

Thr Val Tyr Glu Ile Ile Ile Ile Phe Leu Gln Ala Tyr Ile Phe Ala
275 280 285

Leu Leu Thr Ala Val Tyr Ile Glu Leu Ser Leu His Ala Asp Ser His
290 295 300

<210> 2

<211> 79

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 2

Met Asn Asp Ile Ile Leu Ala Gln Ala Thr Glu Thr Ser Phe Asp Gly
1 5 10 15

Leu Gln Ser Ile Gly Tyr Gly Leu Ala Thr Ile Gly Pro Gly Leu Gly
20 25 30

Ile Gly Ile Leu Val Gly Lys Thr Val Glu Gly Met Ala Arg Gln Pro
35 40 45

Glu Met Ala Gly Gln Leu Arg Thr Thr Met Phe Leu Gly Ile Ala Phe
50 55 60

Val Glu Ala Leu Ala Leu Ile Gly Leu Val Ala Gly Phe Leu Phe
65 70 75

<210> 3

<211> 189

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 3

Met Asn Asn Val Phe Tyr Tyr Leu Ala Ala Glu Gly Glu Ser Leu Pro

1	5	10	15
Leu Glu Gly Gly Asn Ser Leu Leu Phe Pro Lys Ser Tyr Asp Ile Val			
20	25	30	
Trp Ser Leu Ile Pro Phe Leu Ile Ile Leu Ile Val Phe Ala Met Phe			
35	40	45	
Val Ile Pro Lys Phe Gln Glu Leu Leu Gln Glu Arg Glu Asp Arg Ile			
50	55	60	
Glu Gly Gly Ile Lys Arg Ala Glu Ala Gln Gln Ala Glu Ala Lys Ala			
65	70	75	80
Ala Leu Glu Lys Tyr Asn Ala Gln Leu Ala Asp Ala Arg Ala Glu Ala			
85	90	95	
Ala Glu Ile Arg Glu Gln Ala Arg Glu Arg Gly Lys Gln Ile Glu Ala			
100	105	110	
Glu Ala Lys Thr Gln Ala Glu Glu Glu Ala Arg Arg Ile Val Ala Gly			
115	120	125	
Gly Glu Lys Gln Leu Glu Ala Ser Arg Ala Gln Val Val Ala Glu Leu			
130	135	140	
Arg Ser Asp Ile Gly Gln Asn Ser Ile Asn Leu Ala Glu Lys Leu Leu			
145	150	155	160
Gly Gly Glu Leu Ser Glu Ser Thr Lys Gln Ser Ser Thr Ile Asp Asn			
165	170	175	
Phe Leu Ser Glu Leu Asp Ser Val Ala Ser Ala Gly Lys			
180	185		

<210> 4

<211> 271

<212> PRT

<213> Corynebacterium ammoniagenes

<400> 4

Met Lys Ala Ala Ser Arg Glu Ser Leu Ala Ser Ala Thr Glu Ser Leu
1 5 10 15

Asp Ser Asn Leu Ala Ala Gln Ala Gly Val Ala Val Ser Thr Met Thr
20 25 30

Gly Met Glu Leu Phe Glu Val Ser Gln Val Leu Gly Asp Asp Arg Glu
35 40 45

Leu Arg Gly Ala Val Ile Asp Glu Ser Ala Ser Thr Glu Ser Arg Lys
50 55 60

Lys Leu Val Asn Asp Leu Phe Gly Ala Lys Val Ser Pro Ala Thr Leu
65 70 75 80

Gln Val Leu Glu Gln Ile Ala Ser Ser Lys Trp Ser Ser Ala Arg Glu
85 90 95

Met Val Ser Gly Leu Ile Ala Leu Ser Arg Arg Ala Leu Met Arg Gly
100 105 110

Ala Glu Ser Glu Gly Gln Leu Gly Gln Val Glu Asp Glu Leu Phe Arg
115 120 125

Leu Ser Arg Ile Leu Asp Arg Glu Gly Glu Leu Thr Gln Leu Leu Ser
130 135 140

Asp Arg Ala Ala Glu Pro Ala Arg Lys Arg Lys Leu Leu Ala Asp Val
145 150 155 160

Leu Tyr Gly Lys Val Thr Lys Phe Thr Glu Ala Leu Ala Leu Gln Val
165 170 175

Ile Asp Arg Pro Glu His Asn Pro Ile Asp Asp Ile Ala Asn Leu Ala
180 185 190

Ala Glu Ala Ala Gln Leu Gln Gly Arg Thr Val Ala His Val Val Ser
195 200 205

Ala Gly Glu Leu Asn Glu Gly Gln Gln Ala Val Leu Ala Glu Lys Leu
210 215 220

Gly Lys Ile Tyr Gly Arg Ala Met Ser Ile His Ser Glu Val Asp Thr
225 230 235 240

Ser Leu Leu Gly Gly Met Thr Ile Arg Val Gly Asp Glu Val Ile Asp
245 250 255

Gly Ser Thr Ala Gly Lys Ile Glu Arg Leu Arg Thr Ala Leu Lys
260 265 270

<210> 5

<211> 546

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 5

Met Ala Glu Leu Thr Ile Ser Ser Asp Glu Ile Arg Ser Ala Ile Ala
1 5 10 15

Asn Tyr Thr Ser Ser Tyr Ser Ala Glu Ala Ser Arg Glu Glu Val Gly
20 25 30

Val Val Ile Ser Ala Ala Asp Gly Ile Ala Gln Val Ser Gly Leu Pro
35 40 45

Ser Val Met Ala Asn Glu Leu Leu Glu Phe Pro Gly Gly Val Ile Gly
50 55 60

Val Ala Gln Asn Leu Glu Thr Asn Ser Ile Gly Val Val Ile Leu Gly
65 70 75 80

Asn Tyr Glu Ser Leu Lys Glu Gly Asp Gln Val Lys Arg Thr Gly Glu
85 90 95

Val Leu Ser Ile Pro Val Gly Glu Glu Phe Leu Gly Arg Val Ile Asn
100 105 110

Pro Leu Gly Gln Ala Ile Asp Gly Leu Gly Pro Ile Ala Gly Glu Glu
115 120 125

Asp Arg Val Leu Glu Leu Gln Ala Pro Ser Val Leu Gln Arg Gln Pro
130 135 140

Val Glu Glu Pro Met Gln Thr Gly Ile Lys Ala Ile Asp Ala Met Thr
145 150 155 160

Pro Ile Gly Arg Gly Gln Arg Gln Leu Ile Ile Gly Asp Arg Lys Thr
165 170 175

Gly Lys Thr Ala Val Cys Ile Asp Thr Ile Leu Asn Gln Lys Ala Asn
180 185 190

Trp Glu Ser Gly Asp Lys Asn Lys Gln Val Arg Cys Ile Tyr Val Ala
195 200 205

Ile Gly Gln Lys Gly Ser Thr Ile Ala Gly Val Arg Lys Thr Leu Glu
210 215 220

Glu Gln Gly Ala Leu Glu Tyr Thr Thr Ile Val Ala Ala Pro Ala Ser
225 230 235 240

Asp Ser Ala Gly Phe Lys Trp Leu Ala Pro Phe Ser Gly Ala Ala Leu
245 250 255

Gly Gln His Trp Met Tyr Gln Gly Asn His Val Leu Val Ile Tyr Asp
260 265 270

Asp Leu Thr Lys Gln Ala Glu Ala Tyr Arg Ala Ile Ser Leu Leu Leu
275 280 285

Arg Arg Pro Pro Gly Arg Glu Ala Tyr Pro Gly Asp Val Phe Tyr Leu
290 295 300

His Ser Arg Leu Leu Glu Arg Ala Ala Lys Leu Ser Asp Asp Leu Gly
305 310 315 320

Ala Gly Ser Leu Thr Ala Leu Pro Ile Ile Glu Thr Lys Ala Asn Asp
325 330 335

Val Ser Ala Phe Ile Pro Thr Asn Val Ile Ser Ile Thr Asp Gly Gln
340 345 350

Val Phe Leu Glu Ser Asp Leu Phe Asn Gln Gly Val Arg Pro Ala Ile
355 360 365

Asn Val Gly Val Ser Val Ser Arg Val Gly Gly Ala Ala Gln Thr Lys
370 375 380

Gly Met Lys Lys Val Ala Gly Asn Leu Arg Leu Asp Leu Ala Ser Tyr
385 390 395 400

Arg Asp Leu Gln Gly Phe Ala Ala Phe Ala Ser Asp Leu Asp Pro Val
405 410 415

Ser Lys Ala Gln Leu Glu Arg Gly Glu Arg Leu Val Glu Ile Leu Lys
420 425 430

Gln Ser Glu Ser Ser Pro Gln Ala Val Glu Tyr Gln Met Val Ser Ile
435 440 445

Phe Leu Ala Glu Glu Gly Val Phe Asp Val Val Pro Val Glu Asp Val
450 455 460

Arg Arg Phe Glu Ala Asp Val Gln Glu Tyr Leu Gln Gln Asn Thr Pro
465 470 475 480

Glu Val Tyr Glu Gln Ile Ala Gly Gly Lys Ala Phe Thr Asp Glu Ser
485 490 495

Lys Glu Ala Leu Leu Ala Ala Ala Lys Asp Phe Thr Pro Ser Phe Arg
500 505 510

Thr Thr Glu Gly His Asn Leu Gly Thr Glu Ala Pro Val Asp Pro Leu
515 520 525

Ala Glu Glu Glu Val Lys Lys Thr Glu Val Thr Val Ser Arg Lys Ser
530 535 540

Ala Lys
545

<210> 6

<211> 327

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 6

Met Ala Asn Leu Arg Glu Leu Arg Asp Arg Ile Arg Ser Val Asn Ser
1 5 10 15

Thr Lys Lys Ile Thr Lys Ala Gln Glu Leu Ile Ala Thr Ser Arg Ile

20

25

30

Thr Lys Ala Gln Ala Lys Val Asp Ala Ala Ala Pro Tyr Ala His Glu

35

40

45

Met Ser Asn Met Met Asp Arg Leu Ala Ser Ala Ser Ser Leu Glu His

50

55

60

Pro Met Leu Arg His Arg Glu Asn Gly Lys Val Ala Ala Val Leu Val

65

70

75

80

Val Ser Ser Asp Arg Gly Met Cys Gly Gly Tyr Asn Asn Asn Val Phe

85

90

95

Lys Lys Ala Ala Glu Leu Glu Gly Leu Leu Arg Gly Gln Gly Phe Asp

100

105

110

Val Val Arg Tyr Val Thr Gly Ser Lys Gly Val Gly Tyr Tyr Asn Phe

115

120

125

Arg Glu Lys Glu Val Val Gly Ala Trp Thr Gly Phe Ser Gln Asp Pro

130

135

140

Ser Trp Glu Gly Thr His Asp Val Arg His His Leu Val Asp Gly Phe

145

150

155

160

Ile Ala Gly Ser Glu Gly Thr Thr Pro Ala Arg Gln Gly Val Asn Thr

165

170

175

Glu Asp Gln Thr Val Arg Gly Phe Asp Gln Val His Val Val Tyr Thr

180

185

190

Glu Phe Glu Ser Met Leu Val Gln Thr Pro Arg Ala His Gln Leu Leu

195

200

205

Pro Ile Glu Pro Val Ile Lys Glu Glu Glu Leu His Leu Gly Asp Ser

210

215

220

Ala Leu Glu Ala Asn Pro Asp Ala Gln Gly Leu Ser Ala Asp Tyr Glu
 225 230 235 240

Phe Glu Pro Asp Ala Asp Thr Leu Leu Ser Ala Leu Leu Pro Gln Tyr
 245 250 255

Val Ser Arg Ile Leu Phe Ser Met Phe Leu Glu Ala Ser Ala Ser Glu
 260 265 270

Ser Ala Ala Arg Arg Thr Ala Met Lys Ala Ala Thr Asp Asn Ala Asn
 275 280 285

Asp Leu Val Thr Asp Leu Ser Arg Val Ala Asn Gln Ala Arg Gln Ala
 290 295 300

Gln Ile Thr Gln Glu Ile Thr Glu Ile Val Gly Gly Ala Gly Ala Leu
 305 310 315 320

Ala Glu Ser Ala Glu Ser Asp
 325

<210> 7

<211> 481

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 7

Met Thr Thr Ala Leu His Glu Gln Asn Thr Gln Glu Ser Ala Ile Ala
 1 5 10 15

Gly Arg Val Val Arg Val Ile Gly Pro Val Val Asp Val Glu Phe Pro
 20 25 30

Arg Gly Gly Leu Pro Ala Leu Tyr Asn Ala Leu Thr Val Glu Ile Asn
 35 40 45

Leu Glu Ser Val Ala Arg Thr Ile Thr Leu Glu Val Ala Gln His Leu
 50 55 60

Gly Asp Asn Leu Val Arg Thr Val Ser Met Ala Pro Thr Asp Gly Leu
 65 70 75 80

Val Arg Arg Ala Ala Val Thr Asp Thr Glu Ala Pro Ile Ser Val Pro
 85 90 95

Val Gly Asp Val Val Lys Gly His Val Phe Asn Ala Leu Gly Asp Cys
 100 105 110

Leu Asp Glu Pro Gly Leu Gly Arg Asp Gly Glu Gln Trp Gly Ile His
 115 120 125

Arg Glu Pro Pro Ala Phe Asp Gln Leu Glu Gly Lys Thr Glu Ile Leu
 130 135 140

Glu Thr Gly Ile Lys Val Ile Asp Leu Leu Thr Pro Tyr Val Lys Gly
 145 150 155 160

Gly Lys Ile Gly Leu Phe Gly Gly Ala Gly Val Gly Lys Thr Val Leu
 165 170 175

Ile Gln Glu Met Ile Thr Arg Ile Ala Arg Glu Phe Ser Gly Thr Ser
 180 185 190

Val Phe Ala Gly Val Gly Glu Arg Thr Arg Glu Gly Thr Asp Leu Phe
 195 200 205

Leu Glu Met Glu Glu Met Gly Val Leu Gln Asp Thr Ala Leu Val Phe
 210 215 220

Gly Gln Met Asp Glu Pro Pro Gly Val Arg Met Arg Val Ala Leu Ser
225 230 235 240

Gly Leu Thr Met Ala Glu Tyr Phe Arg Asp Val Gln Asn Gln Asp Val
245 250 255

Leu Leu Phe Ile Asp Asn Ile Phe Arg Phe Thr Gln Ala Gly Ser Glu
260 265 270

Val Ser Thr Leu Leu Gly Arg Met Pro Ser Ala Val Gly Tyr Gln Pro
275 280 285

Thr Leu Ala Asp Glu Met Gly Val Leu Gln Glu Arg Ile Thr Ser Thr
290 295 300

Lys Gly Lys Ser Ile Thr Ser Leu Gln Ala Val Tyr Val Pro Ala Asp
305 310 315 320

Asp Tyr Thr Asp Pro Ala Pro Ala Thr Thr Phe Ala His Leu Asp Ala
325 330 335

Thr Thr Glu Leu Asp Arg Ala Ile Ala Ser Lys Gly Ile Tyr Pro Ala
340 345 350

Val Asn Pro Leu Ser Ser Thr Ser Arg Ile Leu Glu Pro Ser Ile Val
355 360 365

Gly Glu Arg His Tyr Ala Val Ala Gln Arg Val Ile Asn Ile Leu Gln
370 375 380

Lys Asn Lys Glu Leu Gln Asp Ile Ile Ala Ile Leu Gly Met Asp Glu
385 390 395 400

Leu Ser Glu Glu Asp Lys Ile Thr Val Gln Arg Ala Arg Arg Ile Glu
405 410 415

Arg Phe Leu Gly Gln Asn Phe Phe Val Ala Glu Lys Phe Thr Gly Leu
420 425 430

Pro Gly Ser Tyr Val Pro Leu Ala Asp Thr Ile Asp Ala Phe Glu Arg
435 440 445

Ile Cys Asn Gly Glu Phe Asp His Tyr Pro Glu Gln Ala Phe Asn Gly
450 455 460

Leu Gly Gly Leu Asp Asp Val Glu Ala Ala Tyr Lys Lys Leu Thr Glu
465 470 475 480

Lys

<210> 8

<211> 123

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 8

Met Ala Asp Ile Thr Val Glu Leu Val Ser Val Glu Arg Met Leu Trp
1 5 10 15

Ser Gly Lys Ala Thr Ile Ile Ser Ala Glu Thr Thr Glu Gly Glu Ile
20 25 30

Gly Val Leu Pro Gly His Glu Pro Leu Leu Gly Gln Leu Ala Glu Asn
35 40 45

Gly Val Val Thr Phe Arg Pro Val Asp Gly Asp Arg Lys Val Ala Ala
50 55 60

Val Gln Gly Gly Phe Leu Ser Val Ser Thr Glu Lys Ile Thr Val Leu
65 70 75 80

Ala Asp Trp Ala Val Trp Ala Asp Glu Val Asn Glu Ser Gln Ala Gln
85 90 95

Glu Asp Ala Leu Ser Ser Asp Glu Leu Val Ser Ser Arg Gly Gln Ala
100 105 110

Ala Leu Arg Ala Leu Ala Arg Ser Arg Glu Ser
115 120

<210> 9

<211> 912

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 9

atgtgcgacg gagtcgtag ctgtgacaga gagtttgaga cgtccatcgc accgtacgac 60
gtcgacaatc gtacggcccg aacacgggag agaacgctga gcgttacaac attggccatg 120
aaggtagct tccacgcgcc cgaactggac ccagaatttt tcccggggca atattacggc 180
gacatcctgt tcgacgatgt gttgggcgga tggttcgac ttgatcgcat catgctggtt 240
cgtctgttga tgaccgcctt cttggtgctt ttatttattg cagcatttag gaacccaaag 300
ctggttccta agggactaca gaacgtcgca gaatacgcgt tagatttcgt ccgaattcac 360
attgctgagg acatcctggg caagaaggag gtcgctcgct tcctaccgtt gctggcggct 420
atcttcttcg gcaccctttt ctggaacgtc tccacgatta ttccggcact gaacatctcc 480
gcaaacgctc gtattggcat gcctattgtc ttggctggcg cagcgtatat cgcaatgatt 540
tacgcaggca ccaagcgcta tggcttcggt aagtagtca agtcgtcggt gggtattcct 600

aaccttccac cggtttgca cttgctgggt gttccaattg agtttttctc gaccttcac 660
 ttgcgtcccg tcactctggc aattcgtctt atggcgaact tccttgccgg ccacatcatt 720
 ttggttctgc tgtactctgc caggaacttc ttcttctggc agctcaacgg ctggacagcg 780
 atgtccgggtg tgacctgct cgcagcgggt ctgtttacgg tctacgagat catcatcacc 840
 ttctgcagg catacatctt tgctctgctg acggcgggtg acatcgagtt gtcacttcac 900
 gcagactcgc ac 912

<210> 10

<211> 237

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 10

atgaacgaca tcattctggc tcaggcaacc gagacctcct tcgatggcct tcagtccacc 60
 ggctacggcc ttgcaaccat cgccctggc ttgggtattg gtatcctcgt cggcaagacc 120
 gttgagggca tggcagtcg cctgagatg gctggccagc tgcgtaccac catgttctg 180
 ggtatgcct tcgttgaggc tcttgcaatt atcgccctgg ttgcaggctt cctgttc 237

<210> 11

<211> 567

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 11

atgaacaacg tcttttacta tcttgacgc gaaggagagt cccttcact ggaagggtgc 60

aactcccttc tgtttcccaa gagctatgac atcgtctggt ctctgateccc gttcttaatc 120
atccttattg tcttcgcaat gtttgtcatt ccgaagtcc aggaactgtt gcaagagcgt 180
gaagaccgga ttgaggcgcg catcaagcgc gctgaagccc aacaggcaga agcaaaggcc 240
gcacttgaga agtacaacgc acagctagct gacgctcgcg cagaggcagc tgaaatccgt 300
gagcaggcgc gtgagcgcg caagcagatt gaagcagagg caaagacca ggcagaggaa 360
gaagcacgcc gtatcgtcgc aggtggcgaa aaacagcttg aagcttccc cgcacaggta 420
gttgctgaac tgcgttcga tatcgacag aactccatca acttggtga gaagctgctc 480
ggcgggtgaac tctctgagtc caccaagcag tcttcaacca ttgataactt cctgtccgag 540
ctcgactctg tggcatcggc cggaaag 567

<210> 12

<211> 813

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 12

atgaaggcag ctagccgca atcgtcgc tccgctaccg agtcgctgga ttccaatctg 60
gcagctcaag caggtgtagc agtgtccacc atgaccggca tggaactgtt cgaggtttcc 120
caagtattgg gtgatgaccg cgaactccgt ggagcagtca ttgatgaatc tgcttccact 180
gaatcccgca agaagctcgt taatgatctc ttcgggtgcca aagtttctcc tgctaccttg 240
caggttctgg aacagattgc atcgtcgaag tggcgcgagc cccgcgagat ggtttccgga 300
ctgategctc tttcacgtcg tgctttgatg cgcggcgagc aaagcgaagg acaactagga 360

caggtcgaag atgaactctt ccgcttgtcc cggatcctgg accggaagg cgaactcacc 420
 cagctgcttt ctgaccgagc tgcagaacct gcgcgtaagc gcaagttgct ggcagatgtg 480
 ctttacggaa aggtcaccaa attcaactgag gcgcttgccg tgcaggtgat tgaccgccct 540
 gagcacaatc ccattgatga cattgcgaat ctggcggctg aagcagcaca gcttcagggt 600
 cgcactgttg cgcacgttgt tagtgccggg gaactcaatg aaggccagca ggcagtactc 660
 gccgagaagc tgggcaagat ttatggctgt gcgatgtcca tccactctga ggttgacacc 720
 agcctcctcg gtggtatgac aatccgcgta ggcatgaag ttattgacgg ttctaccgca 780
 ggcaaaattg agcgctgcg taccgctttg aag 813

<210> 13

<211> 1638

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 13

atggcggagc tgacgatctc ctccgatgag atccgtagcg cgatagcgaa ctacacctcg 60
 agctactccg cggaggcctc ccgtgaggag gtcggcgtgg tcatttcggc agctgacggg 120
 attgcacagg tttctgggct accttcagtt atggcgaatg agctgctcga gttccctggc 180
 ggcgtaatcg gcgtgcaca aaaccttgaa accaactcca ttggcgttgt tattcttggt 240
 aactacgagt ccctcaaaga aggcgaccaa gttaagcgaa ctggcgaagt tctctccatc 300
 ccagtgggtg aagagttcct cggccgcgtt attaaccat tgggtcaggc aattgacggc 360

ctgggcccaa tcgctggcga agaggaccgc gtcctcgagc tgcaggcacc ttccgtgttg 420
 cagcgtcagc cagttgaaga gccaatgcag accggcatca aggctattga tgctatgacc 480
 ccaatcggtc gcggtcagcg tcagctcatc attggtgacc gtaagactgg taaaaccgca 540
 gtctgcatcg acaccatcct taaccagaag gctaactggg aatccggcga caagaacaag 600
 caagttcgtt gtatctacgt cgctattggc cagaagggtt ccaccatcgc tgggtgccgc 660
 aagaccctcg aagagcaggc cgtctggagc tacaccacca tcgtggctgc tectgtttct 720
 gactccgcgg gttcaagtg gttggcacca ttctccggtg ctgctcttgg tcagcactgg 780
 atgtaccagg gcaaccacgt cttggtcatc tatgatgact tgaccaagca ggctgaggct 840
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 gtctttctact tgcactcccg tctgctggag cgtgctcga agctctccga tgatttgggt 960
 gcaggttctt tgaccgcact gccattatt gaaaccaagg cgaatgacgt gtctgcgttc 1020
 attccaacca acgttatctt cattaccgac ggccaggctt tectggagtc cgacctgttc 1080
 aaccaaggcg tccgtccggc aattaacgtc ggtgtgtcgg tttccgtgt tgggtggcgt 1140
 gtcagacca aggttatgaa gaaggttgca ggtaacctgc gtcttgacct cgcttcctac 1200
 cgtgatctgc agggctttgc tgccttcgct tctgacttgg acccagtgtc caagggccag 1260
 cttgagcgcg gtgagcgtct ggttgagatc ctgaagcagt ctgagtcttc tctcaggca 1320
 gtcgagtacc agatggtttc catcttcttg gctgaagaag gcgtcttcga cgctgttctt 1380
 gtcgaagatg ttcgtcgtt tgaggctgac gttcaggaat acctgcagca gaacacccca 1440

gaggtttacg agcagattgc cggcggttaag gcatttaccg acgagtccaa ggaagccctg 1500
 ttggctgcag ctaaggactt cactccttcc ttccgcacca ccgagggcca caacttgggc 1560
 actgaagctc cagttgatcc tttggctgaa gaagaagtca agaagactga agtcaccgtc 1620
 tcccgtaagt cggctaag 1638

<210> 14

<211> 981

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 14

atggcaaate ttgcgaatt gcgcgaccgt atccggtccg tgaactcgac caagaagatc 60
 accaaggcgc aggagctgat tgcaacttct cgcattacca aggcgcaagc caaggttgat 120
 gcagcagcac cgtacgcaca cgagatgtcg aacatgatgg accgtcttgc atcggttagc 180
 tcgttgagc acccaatgct gcgccaccgt gaaaacggca aagttgcagc cgtactcgtg 240
 gtctcttctg accgcggtat gtgtggtggc tacaacaaca acgtctttaa gaaggctgct 300
 gagctegaag gactccttcg cggtaagge ttgcagttg tccgctacgt aaccggtagc 360
 aaggcgctcg gctactacaa ctcccgtag aggaagttg tgggcgcgtg gactggcttt 420
 tctcaggatc cgtcctggga aggcactcac gacgttcgtc accacttggt tgacggcttc 480
 attgctggct ccgaaggtag aactccggcc cgtcaggggc tgaacaccga agaccaaagc 540
 gtacgtggtt tcgaccaggt acacgttggt tacaccgagt tcgaatccat gctggttcag 600
 actccacgtg ctcaccagtt gttgccgatt gaaccggtaa ttaaagaaga ggaacttcac 660

ctgggcgact cggcgctaga agccaaccct gatgctcagg gcctgtctgc tgactacgag 720
 tttagccgg atgcagatac ttgctctcg gcattctgc cgcagtatgt atcacgtatc 780
 cttttctcga tgttcttgga ggcttcggct tctgagtcg cagctcgctg aactgcaatg 840
 aaggctgcga ctgacaacgc taatgacttg gtaaccgact tgtctcgtgt tgctaaccag 900
 gctcgtcagg cgcagattac ccaggaaatc acagaaatcg tcggtggcgc tggcgcgctc 960
 gccgaaagcg cagaaagtga c 981

<210> 15

<211> 1443

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 15

atgactacag ctctgcatga gcagaacaca caggagtcgg caattgccgg ccgtgtggtg 60
 cgtgtcatcg gtccggtcgt cgacgtggag ttcccgcgtg gggactacc ggcactgtat 120
 aatgcactga ccgtcgagat taacctcgag tctgttgac gcaccattac ccttgagggt 180
 gcacagcacc tcggcgacaa cctggttcgt accgtttcga tggcacctac cgatggtctt 240
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